STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 6596

Tariff filing of Citizens Communications Company,
d/b/a Citizens Energy Services, requesting a rate
increase in the amount of 40.02%, to take effect
December 15, 2001

PREFILED DIRECT TESTIMONY OF
BRUCE EDWARD BIEWALD
ON BEHALF OF THE
VERMONT DEPARTMENT OF PUBLIC SERVICE

Synapse Energy Economics, Inc.
22 Pearl Street, Cambridge, MA 02139

March 7, 2002

Summary: Mr. Biewald's testimony addresses used and useful policy issues, and their application to Citizens' purchase from Hydro Quebec, including projection of electricity market prices and the above market costs of the purchase.

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Prefiled Direct Testimony
of
Bruce Edward Biewald

1. Introduction

Q. Please state your name.

A. My name is Bruce Edward Biewald.

Q. State your name, occupation and business address.

A. My name is Bruce Edward Biewald. My address is Synapse Energy Economics, Inc., 22 Pearl Street, Cambridge, Massachusetts, 01239.

Q. Please describe your current employment.

A. I am President of Synapse Energy Economics, Inc., a consulting company specializing in economic and policy analysis of the electric industry, including restructuring, consumer protection, market power, electricity market prices, stranded costs, efficiency, renewable energy, environmental quality, and nuclear power. My resume is available on request.

Q. What are your qualifications in the fields of electric utility regulation and energy policy?

A. I graduated from the Massachusetts Institute of Technology in 1981, where I studied energy use in buildings. I was employed for 15 years at the Tellus

Institute, where I was Manager of the Electricity Program, responsible for studies on a broad range of electric system regulatory and policy issues. I have testified on energy issues in more than seventy regulatory proceedings in twenty-five states, two Canadian provinces, and before the Federal Energy Regulatory Commission. I have co-authored more than one hundred reports, including studies for the Electric Power Research Institute, the U.S. Department of Energy, the U.S. Environmental Protection Agency, the Office of Technology Assessment, the New England Governors' Conference, the New England Conference of Public Utility Commissioners, and the National Association of Regulatory Utility Commissioners. My papers have been published in the *Electricity Journal*, *Energy Journal*, *Energy Policy*, *Public Utilities Fortnightly* and numerous conference proceedings, and I have made presentations on the economic and environmental dimensions of energy throughout the U.S. and internationally. Recently I have been consulting for federal agencies, including the Department of Energy, the Department of Justice, the Environmental Protection Agency, and the Federal Trade Commission.

Q. Have you previously testimony before the Vermont Public Service Board?

A. Yes. I testified on behalf of the Department of Public Service in the following dockets:

1) Docket No. 5854 on electric industry restructuring (hearings in July

1996).

2) Docket No. 5983 on GMP's rates (direct testimony in October 1997, rebuttal testimony in December 1997, and supplemental rebuttal testimony in January 1998).

3) Docket No. 6018 on CVPS's rates (direct testimony in February 1998).

4) Docket No. 6107 on GMP's rates (direct testimony in September 1998).

5) Docket Nos. 6120 and 6460 on CVPS's rates (direct testimony in March 2001, and surrebuttal testimony in April, 2001).

6) Docket No. 6545 on the sale of Vermont Yankee (direct testimony in January 2002).

In addition, I have assisted the Department in other dockets including the prior CVPS case (Docket No. 6020) and the recently concluded GMP rate case (Docket No. 6107), both of which were settled.

2. Summary and Recommendations

Q. What is the purpose of your testimony in this case?

A. In this testimony I address used and useful policy issues, and their application to Citizens' purchase from Hydro Quebec. This includes a discussion

of projected market prices and the application these electricity market prices in calculating the above market costs to Citizens of the contract over its remaining life.

Q. Please summarize your conclusions and recommendations.

A. My key conclusions are the following:

- Citizens' Hydro Quebec purchase is uneconomic. It is used, but not economically useful. Applying the Department's market price forecast "DPS 2001c," I estimate the net economic losses over the remaining life of the contract to be $27.9 million in year 2002 present value.

- Using market prices ten percent higher and ten percent lower than those in the reference case analysis, the net economic losses over the remaining life of the contract would be $20.0 million (for the high market price case) or $35.8 million (for the low market price case) in year 2001 present value dollars.

- Recent forward market prices in New England have been down relative to the October time period in which the DPS 2001c forecast was completed. While the DPS forecast has not been updated, the market trend suggests that an update would be down somewhat, perhaps below the Low Case forecast in the near term. To the extent that the reference case forecast is too high, I have

tended to understate the above market costs of the HQ power.

- Vermont's policy, articulated in a long series of decisions, is to share uneconomic costs between ratepayers and shareholders.

- The Board's policy of sharing uneconomic costs is a good one – it is fair and efficient.

- The purchase from Hydro Quebec should not be ascribed any environmental and only minimal risk benefits. There are various plausible scenarios for what might have happened if not for the transaction, but if there was an impact, it was most likely negative.

Based upon my review of regulatory decisions in Vermont and the facts in this case, I find that the Board can and should disallow a portion of the Citizens HQ purchase costs, because they are not used and useful. This would be appropriate even if there were no imprudence involved in the Company's commitment to the transaction. My recommendation in this case is that the Board apply its long-established used and useful policy in determining the appropriate rate treatment for Citizens' HQ purchase, and that any economic calculations done in applying that policy be based upon current electricity market price projections without adjustments for risk or environmental externalities. The degree of sharing of the

excess costs between the Company and its customers is something over which the Board has considerable discretion.

My understanding is that Mr. Paul Chernick's testimony will address the damage caused by imprudence, and that Dr. William Steinhurst's testimony will present the Department's specific ratemaking recommendations for treatment of the costs of the HQ purchase with respect to used and useful, and imprudence.

3. Used and Useful Policy Issues

Q. Please explain what you mean by "used and useful" and how it relates to prudence in utility ratemaking.

A. If a regulated utility incurs costs imprudently, those costs should not be included in the rates that are charged to its customers. Of prudently incurred costs, only those found to be "used and useful" should be charged fully to customers. Costs of resources that are not used and useful should generally be shared between the Company's shareholders and customers. That is, only a portion of the excess costs would be included in regulated rates.

"Used and useful" means something more than "prudent" and more than simply "used." The "useful" portion of the phrase is most reasonably interpreted as "economic."

Q. Is this the "used and useful" policy generally applied in ratemaking treatment of uneconomic resources in Vermont?

A. Yes. The Board has developed a clear policy for the treatment of resources that are not "used and useful." It takes an economic view. That is, simply operating, or even being needed to meet capacity requirements is not sufficient for a resource to be deemed "used and useful." Rather, a resource must be economical. The Board has articulated its policy in several orders. The Board's order in Docket No. 5701/5724 quoted its prior order in Docket No. 5630 as follows:

> Ratemaking decisions in Vermont have been consistent with those federal and other state determinations. Our decision in Docket 5132 examined those precedents in detail.
>
> . . .
>
> In sum, six past precedents offer a consistent set of rules for calculating the rate effects of failed investments in major power plants:
>
> (i) if costs are imprudent, they cannot be included in rates;
>
> (ii) if costs exceed the degree to which projects are used and useful, only one-half of that excess is included in rates; and
>
> (iii) if an arms-length sale has occurred, the net benefits from that sale can be treated as a measure of the degree to which the project is used and useful. (Board Order in Docket No. 5701/5724, page 124, quoting Order in Docket 5630 et al., pages 51 and 52).

The Board also noted that in previous cases, when it found that portions of specific

generation resources were not used and useful, then the losses were split evenly between shareholders and ratepayers. (Board Order in Docket No. 5701/5724, page 124.)

Q. The Board's language quoted above refers to "failed investments in major power plants." Should the policy apply to major purchased power contracts as well?

A. Yes, the Board's used and useful policy should apply to purchased power contracts such as Citizens' purchase from Hydro Quebec. While there are some differences between a purchased power commitment and a power plant investment, it is important that both be treated in a way that is roughly consistent in order to provide an overall policy that is coherent and efficient. Indeed, in the Board's February, 1998, decision in Docket No. 5983 it applied an economic used and useful standard in its rate treatment of GMP's purchase from Hydro Quebec. And again in its January 23, 2001 Order in Docket No. 6107, the Board reaffirmed its used and useful policy. And most recently, in its June 26, 2001 Order in Dockets Nos. 6460 and 6120, the Board again reaffirmed its used and useful policy (pages 27 to 29) in approving a settlement of the issues in that case.

Q. In your view, is the Board's policy for sharing the costs of resources that are not used and useful fair and appropriate?

A. Yes. The Board's approach to ratemaking for uneconomic resources is fair and appropriate. Electric utility investors typically receive a return on their investment considerably above the return on low-risk investments such as treasury bills. The "risk premium" compensates investors for occasional circumstances in which investments fail economically. It is not the role of utility regulators to shield utilities from market risks. According to Bonbright:

> Regulation, it is said, is a substitute for competition. Hence, its objective should be to compel a regulated enterprise, despite its possession of partial or complete monopoly, to charge rates approximating those which it would charge if free from regulation but subject to competition. In short, regulation should not only be a substitute for competition, but a closely imitative substitute. (page 93, James C. Bonbright, *Principles of Public Utility Rates*, Columbia University Press, 1961).

Customers did not make the decisions to commit to the purchase from Hydro Quebec, nor are customers responsible for developments in electric generating technologies and fossil fuel markets that have rendered the purchase badly uneconomic. Under the circumstances, a sharing of the excess costs would be fair and appropriate. It is also economically efficient for management to bear some responsibility for poor economic outcomes.

4. The Economics of Citizens' Purchase from HQ

Q. How does the cost of Citizens' purchase from Hydro Quebec compare with its

value?

A. The cost of the purchase is much higher than its value. I estimate that the cost of Citizens' purchase exceeds its value by $27.9 million over the remaining life of the contract (in year 2002 present value dollars, beginning with the year 2002). The annual figures can are presented in Exhibit DPS-BEB-1, which also shows the annual and total present value over the period.

Q. What discount rate do you use in calculating this value?

A. I used a discount rate of 9 percent, which is the agreed upon cost of capital for Citizens in this case. Specifically, the capital structure is 50 percent debt at 7.1 percent, and 50 percent equity at 11%.

Q. In developing the estimate of above market costs, what did you project for the market price of electricity?

A. My projection of electricity market prices is presented in Exhibit DPS-BEB-1. It is the Department's "DPS 2001c" forecast. It is based on the price forecast described in the January 7, 2002 testimony of DPS witness David Lamont in the Vermont Yankee sale case (Docket No. 6545) and used in my analysis of the economics of the proposed sale of Vermont Yankee (Biewald pft. in Docket No. 6545). The "DPS 2001c" forecast is based upon electricity futures market prices for the next few years, and then is trended to an "equilibrium" price based upon the

cost of owning and operating a natural gas combined cycle plant. The projected market price is $38.8/MWh in 2002 declining to $34.4/MWh in 2004, after which it increases gradually. (These prices are in nominal dollars, including capacity, for a high capacity factor.) The calculations for low and high market price cases are provided in Exhibits DPS-BEB-2 and 3, respectively. I also applied an upward adjustment of 7.8% to account for the 75% capacity factor of the Hydro Quebec resource. I also included an upward adjustment of an additional 3% to represent the advantages associated with scheduling flexibility. The latter adjustment was provided by DPS Witness Paul Chernick.

Q. Is your economic analysis dependent upon an assumption that the alternative to Citizens' purchase from Hydro Quebec is spot market purchases?

A No. In this and in previous testimony I compare the costs of the purchase from Hydro Quebec with the market prices for electricity in New England. Those market prices are routinely forecast in a manner that includes capacity and energy. Year to year prices will fluctuate, but because the forecasts (and the actual market prices) are in large part determined by the assumed cost of market entry, there is a strong feedback mechanism to "correct" prices that are too high or too low relative to the cost of building and operating a new power plant.

Q. Has Citizens forecast the above market costs associated with its purchase from Hydro Quebec over the life of that purchase?

A. Not that I am aware of.

5. Environmental Impacts, Risk Implications, and Scheduling Flexibility

Q. Should the purchase from Hydro Quebec be ascribed credit for environmental benefits, risk reduction, or scheduling flexibility?

A. It should not be credited for environmental benefits or risk reduction. For scheduling flexibility, at most a very small credit should be accounted for in applying the market prices to quantify the purchases value.

Q. Why should there be no environmental credit ascribed to the Hydro Quebec purchase in applying used and useful ratemaking?

A. In most outcomes that I can contemplate, if Citizens had not made this purchase, the change in terms of environmental impacts would have been nil. In the few situations where I can imagine some net environmental impact, the impacts in the absence of the purchase would have been less severe. The possible resource changes that I can think of that might possibly be attributed to Vermont's purchase from Hydro Quebec are: (1) incremental construction of hydro capacity in James Bay; (2) decreased potential sales from Quebec to Ontario; (3) displacement of other possible sales from Quebec to the Northeast US; (4) accelerated development of new gas generation in Quebec; and (5) incremental operation of existing oil-fired plant in Quebec.

In the first case, it must be recognized that the production of electricity in James Bay by Hydro Quebec has its own significant and undesirable environmental consequences. The environmental costs from large-scale hydro generation include significant flooding of pristine wilderness and resulting methane and carbon dioxide emissions, ecological impacts resulting from downstream flow modifications, and cultural impacts on the Native people that occupy the region.

In the second case, that if not for Vermont's purchase then Quebec would have sold the power to Ontario – there could have been considerable environmental benefits depending upon Ontario Hydro's actions. Ontario's generating mix includes some very highly emitting coal generation. If that coal generation were backed down as a result of an Ontario purchase from Quebec, then the environmental effect of additional electricity imports in Ontario would likely have been beneficial compared with the impact of a sale to New England, where oil and gas generation would have been displaced. If instead Ontario decreased its oil generation then the effect likely would have been comparable to the effect of a sale to New England.

The third case is an interesting one. If the effect of Vermont's purchase from Quebec was to displace other possible sales from Quebec into New England, then the net environmental effect is exactly zero.

The fourth case was put forward by one of GMP's witnesses in Docket No. 6107 where he testified that: "Certainly, if the HQ/VJO Contract had been canceled, HQ could have (and did) pursue NUG contract buyouts or deferrals more aggressively." (Oliver pfrt. at 69) If this conjecture were true, then the environmental benefits attributable to the purchase would be the difference between the generation that would have taken place in New England (mainly from new gas-fired NUGs in New England) and the generation deferred in Quebec. If one takes the Quebec NUGs to be gas-fired capacity then this would work out to approximately zero (or negative to the extent that NUG is Quebec would be subject to looser environmental regulations than NUGs in New England).

Finally, the fifth case, with additional oil-fired generation in Quebec, would result in substantially greater environmental impacts. It is possible that the sale of energy from Quebec to Vermont is resulting in the operation of Hydro Quebec's Tracy Station. Tracy is an older 600 MW oil-steam plant that was built in the 1960s and was mothballed in the 1980s only to be rehabilitated several years later. It is particularly likely that in the near term the effect of the sale to Vermont is resulting in increased generation from this plant. To the extent that this is occurring, the environmental impacts of the transaction will be negative, since Tracy's emission rates are higher than the emission rates of marginal New England generation, and much higher than the emission rates of new combined-cycle generation. For example, SO_2 emissions from Tracy are reported at 17 lbs./MWh,

while the SO_2 emissions from the marginal generation in NEPOOL are about 6 lbs./MWh, and the SO_2 emissions from a new gas fired plant are effectively zero.

Q. Why should no risk credit be ascribed to the Hydro Quebec purchase?

A. Because the purchase itself has considerable risks relative to other resource options. In assessing the risks of different resource options, it is well recognized that options involving a firm commitment to a high fixed cost stream such as the purchase from Hydro Quebec are undesirable from a risk perspective. Studies of the "option value" of resource commitments generally find that deferring a decision to lock in to a particular resource has significant real value. The value of deferring irreversible decisions is central to this concept. One paper by Pindyck states:

> "When a firm makes an irreversible investment expenditure, it exercises, or "kills," its option to invest. It gives up the possibility of waiting for new information to arrive that might affect the desirability or timing of the expenditure; it cannot disinvest should market conditions change adversely. This lost option value is an opportunity cost that must be included as part of the cost of the investment." And: "Recent studies have shown that this opportunity cost of investing can be large, and investment rules that ignore it can be grossly in error." (Robert Pindyck, "Irreversibility, Uncertainty, and Investment," Journal of Economic Literature, September 1991, page 1112)

It is a common sense notion that maintaining flexibility has value. Decision tree analysis techniques can be used to quantify that value, given estimated

probabilities for various outcomes. In situations such as electric system resource planning, in which additional information is revealed over time, the value of deferring a decision can be particularly large.

I believe that the Board was quite correct in its decision that because the HQ contract does not have the beneficial risk-reducing attributes of demand-side management resources ("flexibility, short lead time, availability in small increments, and ability to grow with load") that it would be "inappropriate to apply the same risk adjustment to the HQ-VJO Contract that this Board does to energy efficiency resources." Docket No. 6107, Order of 1/23/01 at 47.

Q. Why would only a small credit for scheduling flexibility be appropriate?

A. Citizens' witness Heiber testifies that a 12.5 % credit should be applied in calculated the market value of Citizens' HQ power. His analysis double counts certain types of flexibility, and greatly exaggerates the value of the ability to schedule power in particular months. In practice, Citizens' scheduling of the HQ deliveries to the various months has actually resulted in lost value relative to average monthly deliveries. A proper revision of Mr. Heiber's analysis of scheduling flexibility shows that a value of about 3 percent might be appropriate.

Q. Do you apply a 3 percent value for scheduling flexibility in your analysis of the above market costs of Citizens' HQ purchases?

A. To be conservative we included a 3% scheduling flexibility benefit in addition to the 7.8% adjustment for capacity factor discussed previously.

Q. Does this conclude your testimony?

A. Yes.

Comparison of Citizens' HQ Purchase Costs With Market Value
Reference Case

	HQ Energy (GWh)	HQ Energy Price ($/MWh)	HQ Energy Cost (1000$)	HQ Capacity Cost (1000$)	HQ Total Cost (1000$)	HQ Total Price ($/MWh)	75% CF Market Price ($/MWh)	Market Value (1000$)	Above Market Cost (1000$)	Above Market Cost (1000 year 2002 PV$)
2002	205890.7	26.78662	5515.115	7495.603	13010.72	63.19237	42.99009	8851.257	4159.461	4159.461
2003	205890.7	27.37593	5636.447	7495.603	13132.05	63.78167	40.21619	8280.138	4851.913	4451.296
2004	205890.7	27.9782	5760.449	7495.603	13256.05	64.38394	38.0291	7829.836	5426.217	4567.138
2005	205890.7	28.59372	5887.179	7495.603	13382.78	64.99946	41.67768	8581.046	4801.737	3707.822
2006	205890.7	29.22278	6016.697	7495.603	13512.3	65.62853	45.32627	9332.256	4180.045	2961.249
2007	205890.7	29.86568	6149.064	7495.603	13644.67	66.27143	48.97486	10083.47	3561.202	2314.537
2008	205890.7	30.52272	6284.344	7495.603	13779.95	66.92847	52.62344	10834.68	2945.272	1756.169
2009	205890.7	31.19422	6422.599	7495.603	13918.2	67.59997	56.27203	11585.89	2332.317	1275.857
2010	205890.7	31.8805	6563.897	7495.603	14059.5	68.28624	58.37009	12017.86	2041.644	1024.632
2011	205890.7	32.58187	6708.302	7495.603	14203.91	68.98762	60.4454	12445.14	1758.763	809.7835
2012	200271.1	33.29867	6668.762	7294.13	13962.89	69.71994	62.59458	12535.89	1427.005	602.7824
2013	40806.27	34.03124	1388.688	1576.139	2964.827	72.65616	64.82312	2645.19	319.6369	123.8698
2014	40806.27	34.77993	1419.239	1576.139	2995.378	73.40484	67.13586	2739.564	255.814	90.95078
2015	40214.97	35.54509	1429.445	1553.389	2982.834	74.17222	69.61161	2799.429	183.4049	59.82278
2016	37258.47	36.32708	1353.491	1439.64	2793.131	74.96635	72.28603	2693.267	99.86433	29.88405
2017	37258.47	37.12627	1383.268	1439.64	2822.908	75.76554	74.96273	2792.996	29.91173	8.211907
2018	37258.47	37.94305	1413.7	1439.64	2853.34	76.58232	77.74147	2896.528	-43.1881	-10.8778
2019	37258.47	38.7778	1444.801	1439.64	2884.441	77.41707	80.63285	3004.257	-119.815	-27.6861
2020	31048.73	39.63091	1230.489	1199.7	2430.189	78.27018	83.64023	2596.923	-166.733	-35.3464

Total = 27869.56

Discount R 0.09

Comparison of Citizens' HQ Purchase Costs With Market Value
Low Market Price Case

	HQ Energy (GWh)	HQ Energy Price ($/MWh)	HQ Energy Cost (1000$)	HQ Capacity Cost (1000$)	HQ Total Cost (1000$)	HQ Total Price ($/MWh)	75% CF Market Price ($/MWh)	Market Value (1000$)	Above Market Cost (1000$)	Above Market Cost (1000 year 2002 PV$)
2002	205890.7	26.78662	5515.115	7495.603	13010.72	63.19237	38.69108	7966.132	5044.587	5044.587
2003	205890.7	27.37593	5636.447	7495.603	13132.05	63.78167	36.19457	7452.124	5679.927	5210.942
2004	205890.7	27.9782	5760.449	7495.603	13256.05	64.38394	34.22619	7046.852	6209.2	5226.16
2005	205890.7	28.59372	5887.179	7495.603	13382.78	64.99946	37.50992	7722.941	5659.841	4370.436
2006	205890.7	29.22278	6016.697	7495.603	13512.3	65.62853	40.79364	8399.03	5113.27	3622.37
2007	205890.7	29.86568	6149.064	7495.603	13644.67	66.27143	44.07737	9075.119	4569.549	2969.893
2008	205890.7	30.52272	6284.344	7495.603	13779.95	66.92847	47.3611	9751.208	4028.739	2402.206
2009	205890.7	31.19422	6422.599	7495.603	13918.2	67.59997	50.64483	10427.3	3490.906	1909.645
2010	205890.7	31.8805	6563.897	7495.603	14059.5	68.28624	52.53308	10816.07	3243.43	1627.768
2011	205890.7	32.58187	6708.302	7495.603	14203.91	68.98762	54.40086	11200.63	3003.278	1382.792
2012	200271.1	33.29867	6668.762	7294.13	13962.89	69.71994	56.33512	11282.3	2680.594	1132.312
2013	40806.27	34.03124	1388.688	1576.139	2964.827	72.65616	58.34081	2380.671	584.1559	226.3796
2014	40806.27	34.77993	1419.239	1576.139	2995.378	73.40484	60.42227	2465.607	529.7704	188.3518
2015	40214.97	35.54509	1429.445	1553.389	2982.834	74.17222	62.65044	2519.486	463.3478	151.1342
2016	37258.47	36.32708	1353.491	1439.64	2793.131	74.96635	65.05743	2423.94	369.191	110.4791
2017	37258.47	37.12627	1383.268	1439.64	2822.908	75.76554	67.46645	2513.697	309.2114	84.89028
2018	37258.47	37.94305	1413.7	1439.64	2853.34	76.58232	69.96732	2606.875	246.4647	62.077
2019	37258.47	38.7778	1444.801	1439.64	2884.441	77.41707	72.56957	2703.831	180.6105	41.73424
2020	31048.73	39.63091	1230.489	1199.7	2430.189	78.27018	75.27621	2337.23	92.95901	19.70673
							-0.1		Total =	35783.86
									Discount R	0.09

Comparison of Citizens' HQ Purchase Costs With Market Value
High Market Price Case

	HQ Energy (GWh)	HQ Energy Price ($/MWh)	HQ Energy Cost (1000$)	HQ Capacity Cost (1000$)	HQ Total Cost (1000$)	HQ Total Price ($/MWh)	75% CF Market Price ($/MWh)	Market Value (1000$)	Above Market Cost (1000$)	Above Market Cost (1000 year 2002 PV$)
2002	205890.7	26.78662	5515.115	7495.603	13010.72	63.19237	47.28909	9736.383	3274.335	3274.335
2003	205890.7	27.37593	5636.447	7495.603	13132.05	63.78167	44.23781	9108.152	4023.899	3691.651
2004	205890.7	27.9782	5760.449	7495.603	13256.05	64.38394	41.83201	8612.819	4643.233	3908.117
2005	205890.7	28.59372	5887.179	7495.603	13382.78	64.99946	45.84545	9439.15	3943.632	3045.208
2006	205890.7	29.22278	6016.697	7495.603	13512.3	65.62853	49.8589	10265.48	3246.819	2300.129
2007	205890.7	29.86568	6149.064	7495.603	13644.67	66.27143	53.87234	11091.81	2552.856	1659.181
2008	205890.7	30.52272	6284.344	7495.603	13779.95	66.92847	57.88579	11918.14	1861.804	1110.133
2009	205890.7	31.19422	6422.599	7495.603	13918.2	67.59997	61.89923	12744.47	1173.729	642.0698
2010	205890.7	31.8805	6563.897	7495.603	14059.5	68.28624	64.2071	13219.64	839.8586	421.4967
2011	205890.7	32.58187	6708.302	7495.603	14203.91	68.98762	66.48994	13689.66	514.2491	236.7746
2012	200271.1	33.29867	6668.762	7294.13	13962.89	69.71994	68.85404	13789.48	173.4164	73.25297
2013	40806.27	34.03124	1388.688	1576.139	2964.827	72.65616	71.30544	2909.709	55.11787	21.35999
2014	40806.27	34.77993	1419.239	1576.139	2995.378	73.40484	73.84944	3013.52	-18.1423	-6.45023
2015	40214.97	35.54509	1429.445	1553.389	2982.834	74.17222	76.57277	3079.371	-96.5379	-31.4886
2016	37258.47	36.32708	1353.491	1439.64	2793.131	74.96635	79.51464	2962.594	-169.462	-50.711
2017	37258.47	37.12627	1383.268	1439.64	2822.908	75.76554	82.459	3072.296	-249.388	-68.4665
2018	37258.47	37.94305	1413.7	1439.64	2853.34	76.58232	85.51562	3186.181	-332.841	-83.8326
2019	37258.47	38.7778	1444.801	1439.64	2884.441	77.41707	88.69614	3304.682	-420.241	-97.1064
2020	31048.73	39.63091	1230.489	1199.7	2430.189	78.27018	92.00425	2856.615	-426.425	-90.3995
							0.1		Total =	19955.25
									Discount R	0.09